

**Cybernet**

***ImageTwo*** RC

Stereo Main Amplifier  
A2-RC

**Service Manual**

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## Specifications

<b>Power output (rated minimum RMS sine wave power output 20 Hz to 20 kHz, both channels driven, 0.05% total harmonic distortion)</b>	40W per channel (8 Ohm) 45W per channel (4 Ohm) BTL 120W
Dynamic headroom	1.4 dB (8 Ohm)
Total harmonic distortion, rated power over 20 to 20,000 Hz	0.05% (8 Ohm)
SMPTE intermodulation distortion	0.05%
Frequency response	10 to 100,000 Hz, ±3 dB
Input sensitivity	1V
S/N	100 dB
Input impedance	47 kOhm
Damping factor	50 (8 Ohm)
<b>Load impedance</b>	
Stereo operation A or B	4 to 16 Ohm
Stereo operation A and B	8 to 16 Ohm
BTL operation A or B	8 to 16 Ohm
BTL operation A and B	16 Ohm
Power consumption	200W
Power supply	AC 220V 50/60 Hz
Dimensions (W x H x D)	400 x 118 x 225 mm

# Instruction Information

## Features

The Cybernet Image-II with Remote Control System is a unique, sophisticated high-fidelity stereo system that combines a high quality separate pre- and main-amplifier P2-RC and A2-RC, a front-loader logic controlled stereo cassette deck with Dolby\* noise reduction system C2-RC, a high-sensitivity digital PLL synthesized AM/FM stereo tuner T2-RC, and a handy battery-operated remote control transmitter X2-RC. The model A2-RC is specifically designed to conform with other matching components into a complete stereo system. It features the following:

Direct-coupled OCL power amplifier stage.  
Remote-controllable power on/off from X2-RC transmitter.  
Electronically controlled power transistor protection.  
BTL monophonic operation possible, delivering double output power.  
Contains the power supply for all other matching components.

\* TM Dolby Laboratories.

## Amplifier Connections

Refer to pictorial connection diagram.

**Connection to P2-RC Preamplifier. Very Important: Do not turn on the power switch until all inter-component connections have been completed, or power supply electronics in the main amplifier will be damaged.**

The main amplifier is connected to the preamplifier P2-RC by means of one cable terminated with a 8-pin plug. No other additional connections are necessary. This cable feeds power

## Installation

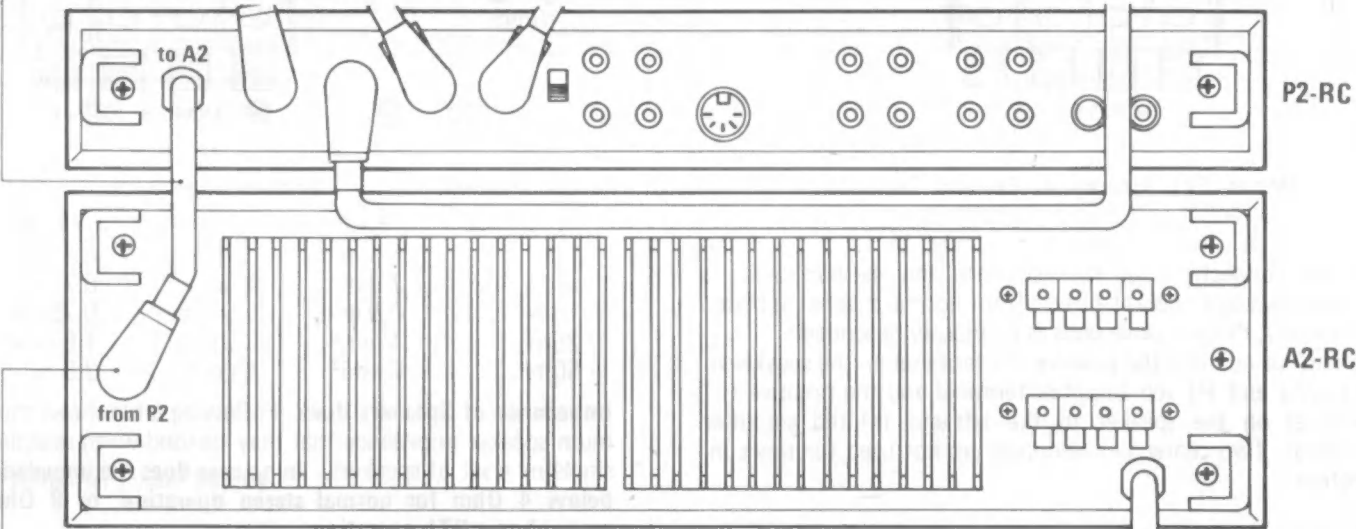
Installation of your main amplifier is not complicated. However, the following guidelines must be followed for satisfactory performance and ease of operation of the unit.

Do not remove the cover — there are no user serviceable parts inside the unit. Refer servicing only to the qualified personnel. The equipment must not be exposed to excessive dust, moisture, or direct sources of heat or sunlight.

To clean the cabinet, wipe with a cloth soaked in a neutral cleaner or a polishing cloth. Do not use benzine or thinner which will damage the cabinet finish.

If mounted where ventilation may be restricted, care must be taken to provide a minimum opening of approximately 320 square-cm, for free air movement, in and out of the cabinet to the room.

Cable from P2-RC to A2-RC  
Cable de P2-RC a A2-RC  
Cavo all'A2-RC da P2-RC



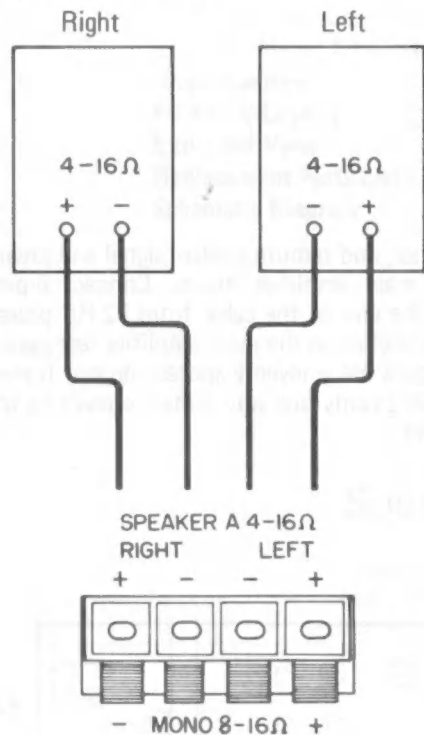
8-pin Plug  
Clavija 8 Patas  
Spina ad 8 Terminali

Power Plug to 220V/50 Hz AC  
Clavija Alimentación 220V/50 Ciclos  
Presa Alimentazione 220V/50 Hz

Speakers

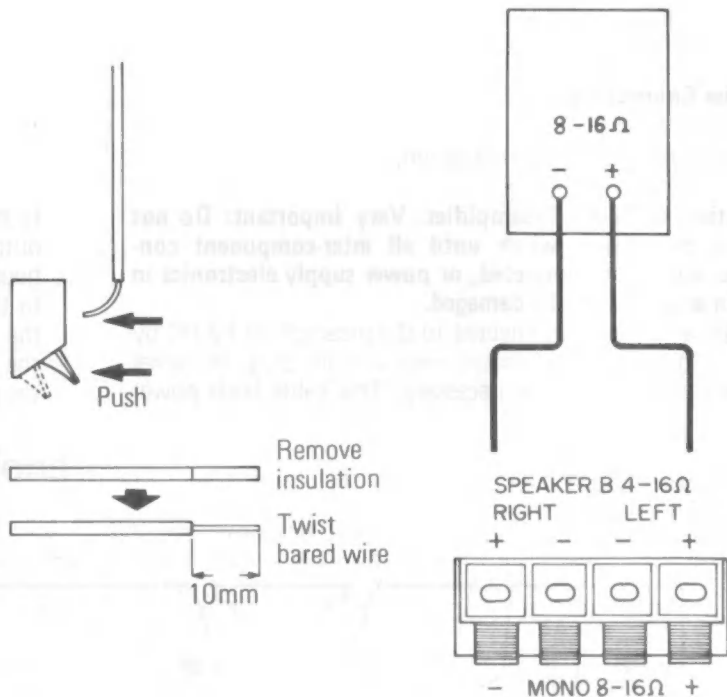
We suggest you first position the speakers in their selected locations in the room before connecting them to A2-RC. This will enable you to cut an adequate length of speaker cable for connection to each speaker. Make each cable a meter longer than necessary to permit changing of speaker locations slightly. Check the cable for some sort of marking which distinguishes one conductor from another. In some cables, one wire is silver-colored, the other copper-colored. In other cases, the insulation over one wire may have a raised rib or line on it to differentiate this conductor from the adjacent one. By properly identify the conductors at each end of a cable, you will be able to make sure that each terminal on a speaker is connected to the proper terminal on the amplifier. This will ensure correct phasing of the speakers in the system, providing optimum imaging and best bass response.

Stereo Speaker Connection



**Normal (Stereo) Speaker Connections.** Prepare cable lead. Remove approximately 10 mm of insulation from its end and twist the bare strands of exposed wire together. The illustration on next page shows the method used to connect a set of speakers (2 speakers for stereo) to the amplifier. To connect a lead prepared as stated, press the lever on the terminal and insert the bared section of the lead into the opening as shown. When the lever is released, the lead will be held securely. Be sure to observe correct polarity; the positive (+) terminal on the speaker must be connected to the (+) amplifier terminal (red) and the negative terminal on the speaker connected to the (-) amplifier terminal (black) in each case. The second set of speakers are likewise connected to Speakers-B terminals.

Mono BTL Speaker Connection



**Single (Mono BTL Operation) Speaker Connection.** On the main amplifier A2-RC, single speaker termination for BTL operation is possible. Special care must be taken to ensure proper connections of speaker since the method used to connect a single speaker differs from normal manner as stated previously. Prepare cable ends as previously described. Be sure to connect the positive (+) terminal on the speaker to the right end (+) red amplifier terminal and the negative (-) terminal on the speaker to the left end (+) red amplifier terminal. Two center (-) terminals are not used for this connection.

**Recommendations for Wires Used.** Following chart will be helpful in determining what gauge of speaker wire to use.

Cable Length	Speaker Impedance		
	4 Ohm	8 Ohm	16 Ohm
2m	1.5 mm <sup>2</sup>	0.75 mm <sup>2</sup>	0.5 mm <sup>2</sup>
5m	2.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>	0.75 mm <sup>2</sup>
10m	2.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>	0.75 mm <sup>2</sup>
25m	4 mm <sup>2</sup>	2.5 mm <sup>2</sup>	1.5 mm <sup>2</sup>
50m	6 mm <sup>2</sup>	4 mm <sup>2</sup>	2.5 mm <sup>2</sup>

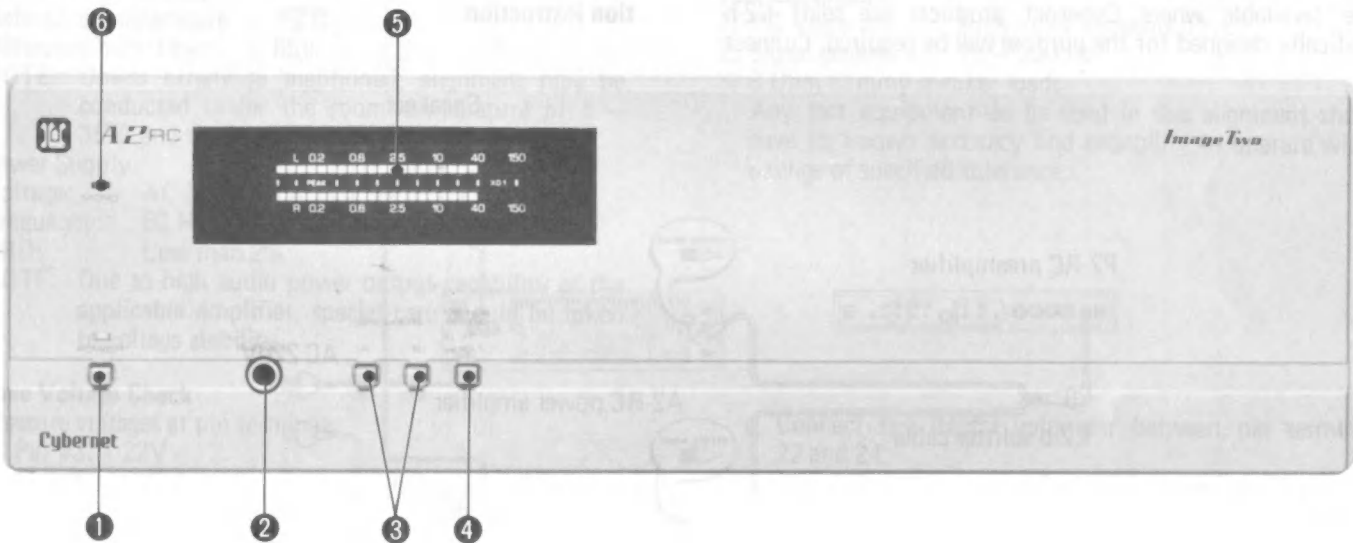
**Impedance of Speakers Used.** Following table shows the minimum speaker impedance that may be used when selecting one single or a set of speakers. **In no case does the impedance fall below 4 Ohm for normal stereo operation, or 8 Ohm for monophonic BTL operation.**

Speakers Used	Acceptable Impedance Range
Single speaker	4 to 16 Ohm
Two speakers	8 to 16 Ohm

Function of Controls

- 1 Power Switch.** Depress to turn power on. This switches in the whole stereo system simultaneously. As you will see in X2-RC Owner's Manual, it is essential to set this switch depressed when you wish to remote-control the power on/off from X2-RC transmitter.
- 2 Headphone Jack.** Accepts a plug from a stereo headphone for private listening. Headphone listening is not possible in BTL operation. **Since the signal is always fed to this jack regardless of the Speaker Selector switch selection, it is recommended that the headphone plug be disconnected when not in use to avoid possible overload.**
- 3 Speaker Selector Switches A/B.** Permit you to select the speaker listening conditions. Depressing the **Speakers-A** switch will connect the sound output to the speakers attached to the **Speakers-A** output terminals, and depressing the **Speakers-B** switch will connect the sound output to the speakers attached to the **Speakers-B**

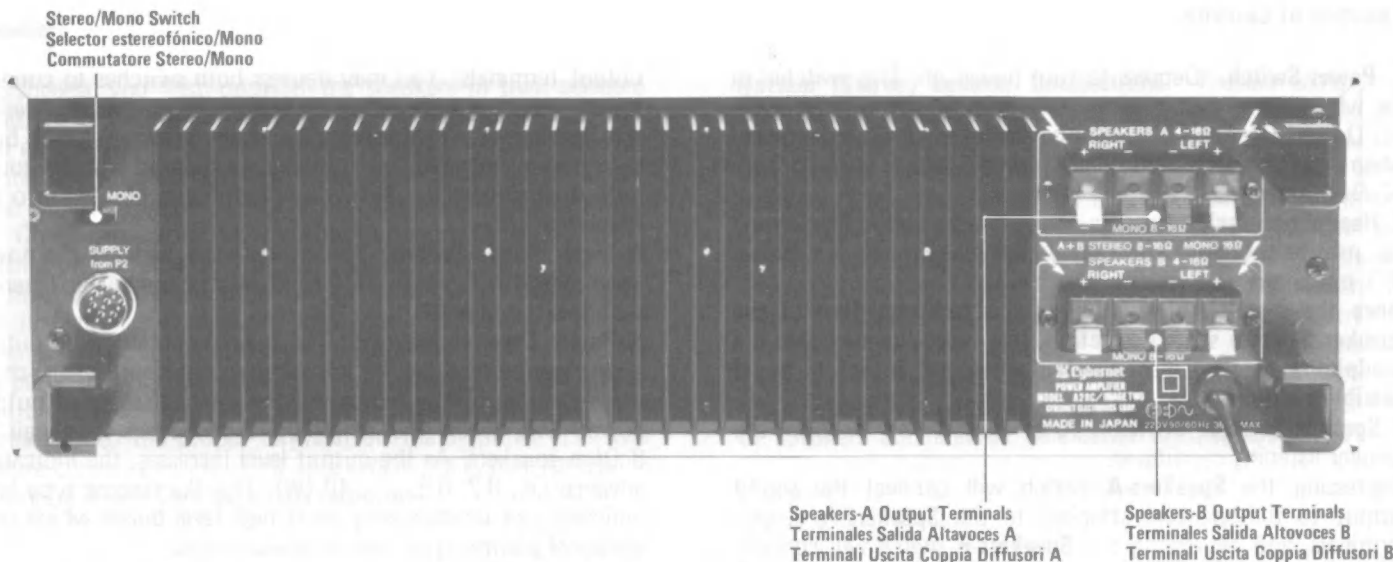
- output terminals. You may depress both switches to connect the sound output simultaneously to the speakers attached to the **Speakers-A** and **Speakers-B** output terminals. When both switches are released, all speakers are silenced and the sound output is connected only to the headphones plugged into the **Phones** jack.
- 4 Meter Range Switch.** When depressed, reduces the power level indicator range to 1/10 time. May be used when listening with low sound levels.
- 5 Power Level Indicators.** The main amplifier audio output power can be read on the left (upper) and right (lower) channel indicators. These indicators give direct readout of output power level when the amplifier is connected to a pair of 8 Ohm speakers. As the output level increases, the indicators advance i.e., 0.2, 0.6, . . . 40 (W). This fluorescent type level indicator can indicate very short high level pulses which conventional pointer type meters cannot follow.
- 6 Mono (BTL) Indicator.** Lights up during BTL operation.



Main Amplifier Power Supply

Plug the power cord into the wall outlet supplying **220V 50 Hz AC**. To be sure of protecting the memory informations in the preamplifier P2-RC, the power cord plug should not be disconnected from the outlet even when the stereo

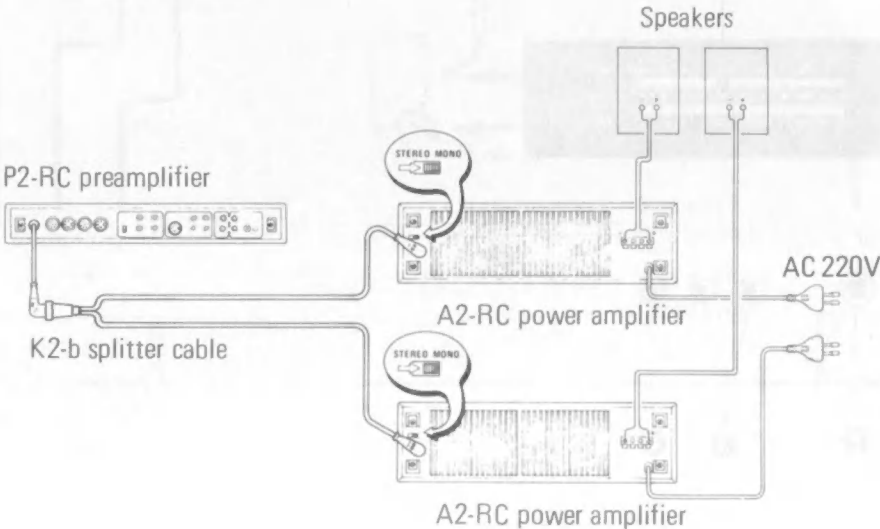
system is not in operation. If the AC power to the amplifier is interrupted for more than 24 hours (due to power failure, etc.), the memory information will completely be lost.



### Mono BTL Amplifier Operation

The diagram below shows an example of the very high power stereo setting by using BTL feature of A2-RC. To complete this setting, two sets of A2-RC main amplifier and a splitter-cable (available where Cybernet products are sold) K2-b specifically designed for the purpose will be required. Connect

the splitter-cable as shown and set the **Stereo/Mono** switches on both main amplifier to **Mono**. Speakers should be attached to each A2-RC in accordance with the **Single Speaker Connection** instruction.



### Trouble Shooting Guide

The following guide is intended as an aid in correcting problems encountered when setting up the stereo system. Although the suggested remedy might seem quite elementary, it may be sufficient to make corrections without returning the unit to your dealer.

Problem	Suggested Remedy
Amplifier inoperative when power switched on.	Check if power cord is correctly plugged to powered outlet.

Indicator lights up but no output, any mode of operation.	Check speaker cables for loose or shorted connection.
No output one channel.	Exchange speaker cables to determine if problem is in speaker cables.
Malphased sound output from speakers with excessive loudness.	Check rear panel Mono-Stereo switch for proper setting.

## Circuit Description

### 1. Power Amplifier

The power amplifier consists of a differential amplifier Q1, transistors Q3, Q5, Q7 and power transistors Q1 and Q3. The circuitry employed is a standard type pure complementary, so no description may be necessary. Transistors Q9 and Q11, each of which is connected to the emitter of the power transistors Q1 and Q3, respectively, operates as a power transistor protection circuit by short-circuiting the Q5 and Q7 base circuit through their emitter-collector circuits when excessive current flows the power transistors.

### 2. Speaker Protection Circuit

The amplifier is equipped with a speaker protection circuit consisting of Q13, Q14 and Q15. This circuit operates as follows: Now assume a positive DC voltage is developed at the speaker terminals, then the voltage (current) flows to the emitter-base circuit of the Q13 through R43 and R45, and this makes Q13 conductive, then Q14 is turned on and the relay K2 is bypassed (speaker switch is opened). Next, when a negative voltage is developed, the cathode voltage of D15 falls to negative and the base bias current

flows through R46 and emitter of Q13. Then Q13 is turned on and the relay K2 is bypassed in the similar way. The transistor Q16 is a time constant circuit which delays operation of the speaker relay K2 to eliminate pop sound which will be caused during power on-off operation.

### 3. Power Switch

The power of the amplifier is controlled by two transistors Q23 and Q22, which in turn control the power relay K1. To turn the power on, Q23 must be biased by connecting the PC board terminals 7 and 6 together.

### 4. Power Meter Circuit

The power meter circuits consists of a meter amplifier U1, voltage regulator Q1 and Q2, and two meter drive ICs U2 and U3. A fraction of audio power output is obtained from the speaker output terminals and applied to the pin 4 (pin 6) of the meter amplifier U1 through a coupling capacitor C2 (C1) and the amplified output is developed at pin 2 (pin 8) and applied to the U3 (U2) to drive the power meter unit(s).

## Service Information

### Measurement Condition

- Reference temperature: 25°C
- Reference humidity: 65%  
NOTE: Unless otherwise mentioned, alignment may be conducted under the room temperature of 5 – 35°C and the room humidity of 45 – 85%.
- Power Supply  
Voltage: AC 220V ± 1%  
Frequency: 50 Hz ± 2%  
THD: Less than 2%  
NOTE: Due to high audio power output capability of the applicable amplifier, special care should be taken to voltage stability.

### 1. Line Voltage Check

Measure voltages at pin terminals:

- Pin #3: 22V
- Pin #4: -22V
- Pin #5: 13V
- Pin #13: approx. 40V
- Pin #15: approx. -40V

### 2. Power Amplifier Idling Current Adjustment

- Connect a digital voltmeter (50–100 mV range) between pin terminals 21 and 23.
- Adjust RV1 to obtain voltage reading of 23–37 mV.

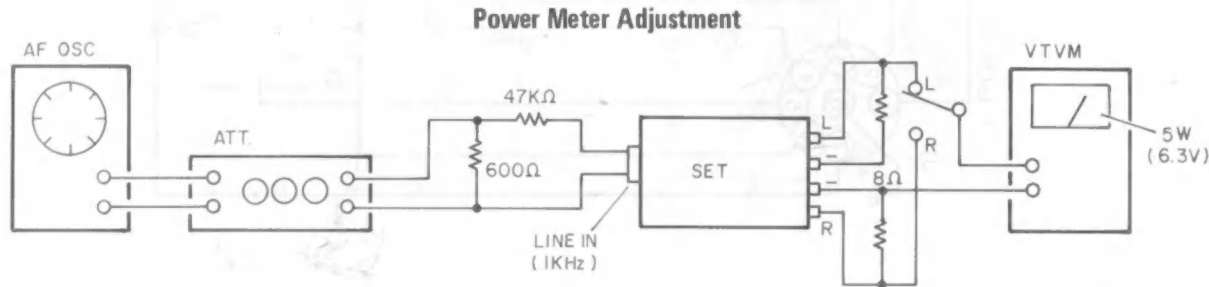
### Test Equipment

- DC Voltmeter: High input impedance type
- Signal generator: 20 – 20 kHz
- 8 Ohm dummy speaker load:  
Any test equipment to be used in this alignment should have its known accuracy and capability to operate within a range of specified tolerance.

- Connect the digital voltmeter between pin terminals 22 and 24.
- Adjust RV2 to obtain the same voltage reading as obtained in (b).

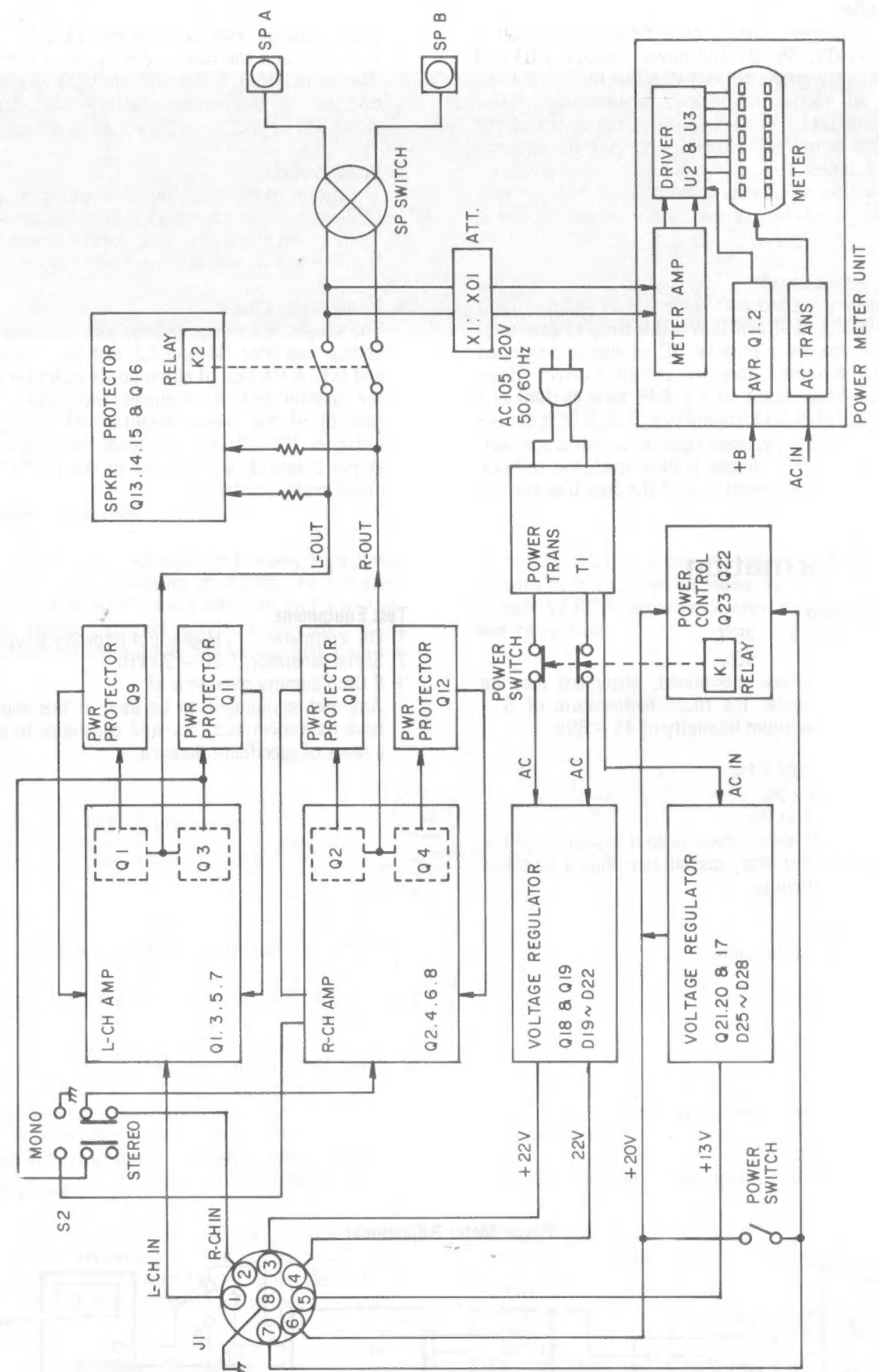
### 3. Power Meter Adjustment (X1)

Feed 1 kHz audio signal to the amplifier input jack and adjust the input signal level so that 5W (6.3V) power output into 8 ohm is obtained. Then adjust RV1 (and RV2) on the power meter PC board until 5W element of the power meter lights up.

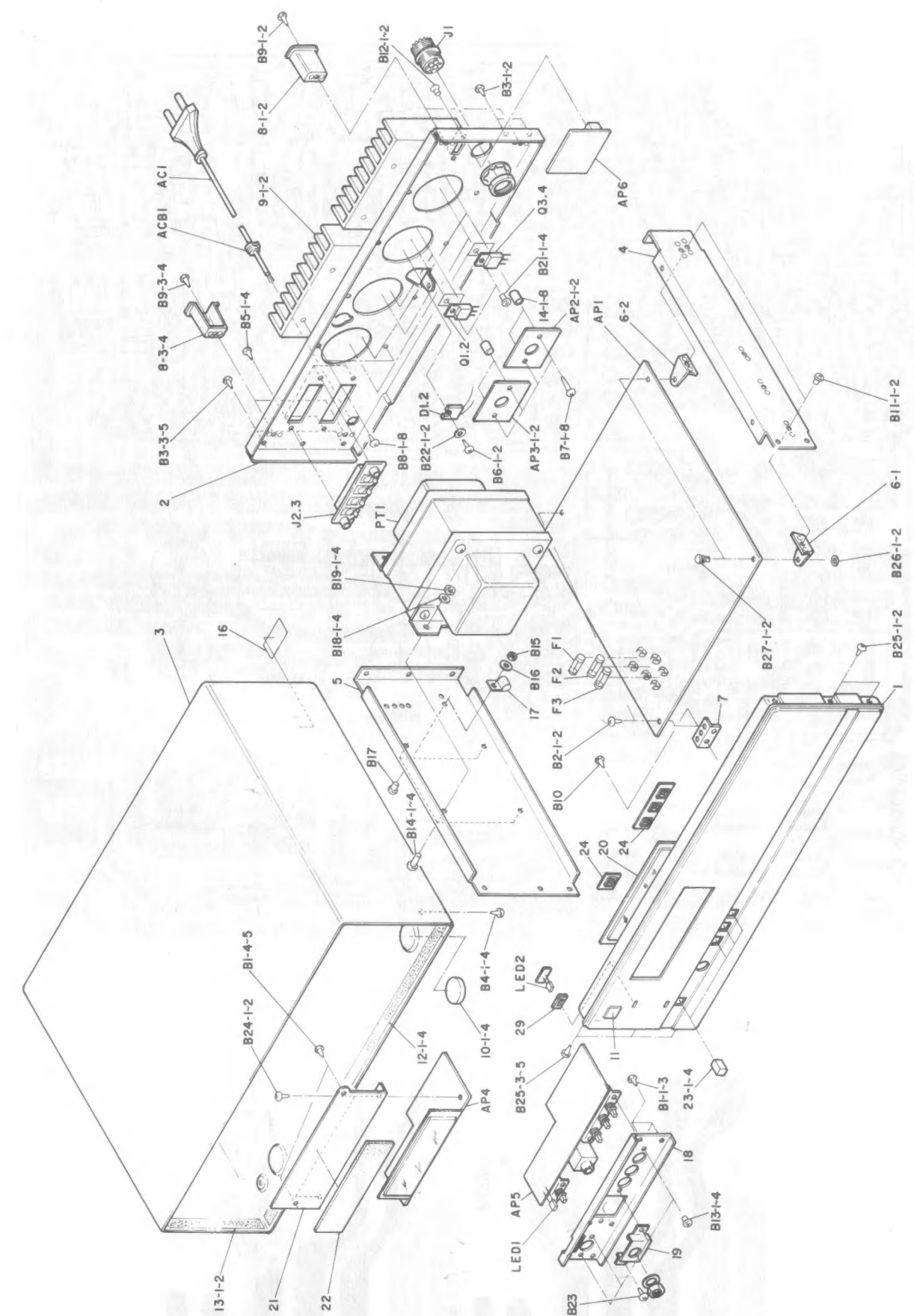


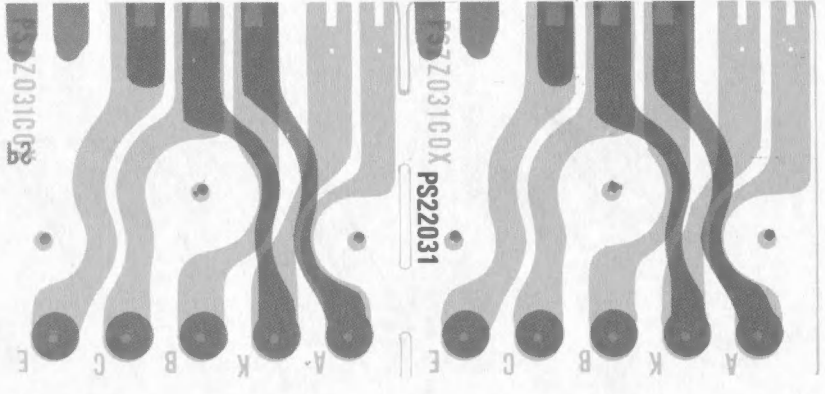
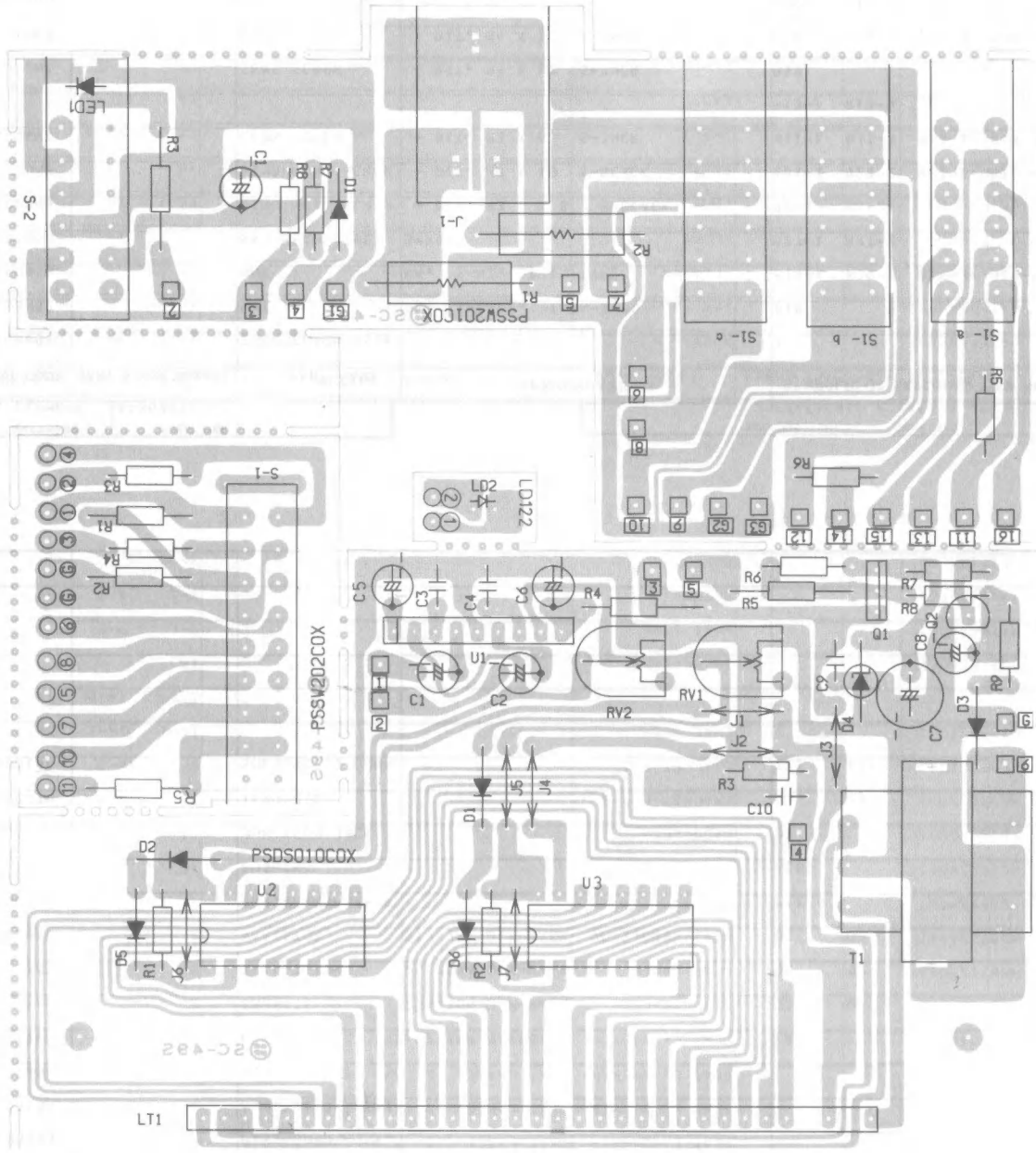


Block Diagram



Exploded View





Replacement Parts List

EXPLODED ASSEMBLY		PART NAME		PART CODE				
		ELEC. ELEMENTS		AAB67ASMCL1				
1	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1		ACAC035EEA		AC CORD ASSY		AC1		1
2	EXPLODED	APSA2RC**1		P.W.B. BOARD ASSY				1
3	EXPLODED	APSMA035C0		P.W.B. BOARD ASSY				1
4	EXPLODED	APSZZ031AA		P.W.B. BOARD ASSY				2
5	EXPLODED	APSZZ031BA		P.W.B. BOARD ASSY				2
6		GA2RC**A04		WIRES KIT				1
7		GLBLN217RN		L.E.D.	LN217RP RED	LED1		1
8		QTA1104XAD		TRANSISTOR	2SA1104 O,Y-RANK	Q3	Q4	2
9		QTC2579XAD		TRANSISTOR	2SC2579 O,Y-RANK	Q1	Q2	2
10		QVESTV3HXD		VARIATOR	STV-3H O,Y-RANK VF 1.60V-1.74V	D1	D2	2
11		TPV95S004Y		PWR. TRANSFORMER		PT1		1
12		VMZ70NB004		BUSHING		ACB1		1
13		YJF08S001Z		JUNCTION JACK		J1		1
14		YTS04S007U		TERMINAL		J2	J3	2
15		ZZZ0000154		SOLDERLESS CONN		ZZ1	ZZ2	2
16								
17								
18								
19								
20								
21								

EXPLODED ASSEMBLY		PART NAME		PART CODE						
		MECH. ELEMENTS		AAB67ASMCL2						
QTY	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1	EXPLODED	AMAZRC**01		ESCUTCHEON ASSY		1				1
2		BNHCL30NSZ		NUT	M3, S-ZNCR, THIN-TYPE	B15				1
3		BNHCL40NSN		NUT	M4, S-NI, THIN-TYPE	B19-1	B19-2	B19-3	B19-4	4
4		BRP3055QNB		PAN HEAD RIVET	3MX5.5	B27-1	B27-2			2
5		BSPB3008NB		BIND HEAD SCREW	+ BIT, M3 X 8 S-BLACK	B6-1	B6-2			2
6		BSPB3010NB		BIND HEAD SCREW	+ BIT, M3 X 10 S-BLACK	B21-1	B21-2	B21-3	B21-4	4
7		BSPC3006NZ		CEMS SCREW	+ BIT, M3 X 6 S-ZNCR	B11-1	B11-2	B13-1	B13-2	6
8						B13-3	B13-4			
9		BSPC3012NZ		CEMS SCREW	+ BIT, M3 X 12 S-ZNCR	B17				1
10		BSPC4010NZ		CEMS SCREW	+ BIT, M4 X 10 S-ZNCR	B14-1	B14-2	B14-3	B14-4	4
11		BSP32604NB		FLAT HD SCREW		B12-1	B12-2			2
12		BTPL300833		NAIL TAP SCREW	+ BIT, M3 X 8 S-BLACK	B3-1	B3-2	B3-3	B3-4	5
13						B3-5				
14		BTPL3008BN		NAIL TAP SCREW		B4-1	B4-2	B4-3	B4-4	4
15		BTTP3008AB		PAN TAP SCREW	+ BIT, M3 X 8 S-BLACK	B5-1	B5-2	B5-3	B5-4	12
16						B8-1	B8-2	B8-3	B8-4	
17						B8-5	B8-6	B8-7	B8-8	
18		BTTP3020AB		PAN TAP SCREW		B7-1	B7-2	B7-3	B7-4	8
19						B7-5	B7-6	B7-7	B7-8	
20		BTPW3008BB		BRAS. TAP SCREW	+ BIT, M3 X 8 S-BLACK	B9-1	B9-2	B9-3	B9-4	4
21		BTPW3008BZ		BRAS. TAP SCREW	+ BIT, M3 X 8 S-ZNCR	B1-1	B1-2	B1-3	B1-4	12

EXPLODED ASSEMBLY		PART NAME		PART CODE											
		MECH. ELEMENTS		AAB67ASMCL2											
ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS				SYMBOLIC OR EXPLODED VIEW NO.				QTY USED		
1									B1-5	B10	B23	B25-1			
2									B25-2	B25-3	B25-4	B25-5			
3		BTPX3008BZ		I.T BT SCREW	+ BIT, M3 X 8 S-ZNCR				B2-1	B2-2			2		
4		BWM30A08SN		FLAT L. WASHER	FLAT LARGE, 3 M/M S-NI				B16				1		
5		BWM30A08SZ		FLAT L. WASHER	FLAT LARGE, 3 M/M S-ZNCR				B26-1	B26-2			2		
6		BWM30705SZ		FLAT L. WASHER	FLAT LARGE, 3 M/M S-ZNCR				B22-1	B22-2			2		
7		BWM40A08SN		FLAT L. WASHER	FLAT LARGE, 4 M/M S-NI				B18-1	B18-2	B18-3	B18-4	4		
8		M8841SX003		SIDE BRACKET					4				1		
9		M8871SE011		REAR PANEL					2				1		
10		M8872SZ042		SIDE BRACKET					5				1		
11		M8887SM007		COVER					3				1		
12		MC231SX001		PHON BRACKET					19				1		
13		ME11XCC001		BADGE.CY3					11				1		
14		ML321SN001		BRACKET PWB-B					7				1		
15		ML321SZ013		BRACKET PWB					6-1	6-2			2		
16		MT254SZ002		CURL BUSH					14-1	14-2	14-3	14-4	8		
17									14-5	14-6	14-7	14-8			
18		MU741SX002		SW BRACKET					18				1		
19		MX764AA001		HEAT SINK					9-1	9-2			2		
20		VB432SB001		SUPPORT					8-1	8-2	8-3	8-4	4		
21		VF172SX004		BUTTON GUIDE					24				1		

EXPLODED ASSEMBLY		PART NAME		PART CODE						
		MECH. ELEMENTS		AAB67ASMCL2						
REMARKS		PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		VN211SM009		BUTTON B		23-1	23-2	23-3	23-4	4
2		V5228RE001		LED SPONGE		29				1
3		VS417NN003		CLAMPER.		17				1
4		VS615YB002		SHEET		13-1	13-2			2
5		VS708YF001		FOOT		10-1	10-2	10-3	10-4	4
6		VS758AK001		PLATE		20				1
7		VS815YB001		SHEET		12-1	12-2	12-3	12-4	4
8		VVL511GE08		LABEL		16				1
9		VVL611GE05		LABEL		31				1

EXPLODED ASSEMBLY		PART NAME		PART CODE													
		ESCUTCHEON ASSY		A* A2RC0001													
ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS				SYMBOLIC OR EXPLODED VIEW NO.				QTY USED				
1		ME87DAM005		ESCUTCHEON					1-D				1				
2		ME87DAX001		ESCUTCHEON					1-A				1				
3		ME87PAX021		ESCUTCHEON					1-C				1				
4		ME87XAX001		ESCUTCHEON					1-B				1				
5																	
1		KPA2RC*E01		INNER CARTON									1				



EXPLODED ASSEMBLY	PART NAME		PART CODE	STOCK NO.	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P.W.B.O.A.R.D. ASSY	APSA2RC001												
1	EXPLODED	APSDS010AD						P.W.B.O.A.R.D. ASSY						1
2	EXPLODED	APSSW201AD						P.W.B.O.A.R.D. ASSY						1
3	EXPLODED	APSSW202AA						P.W.B.O.A.R.D. ASSY						1
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														

EXPLODED ASSEMBLY	PART NAME		PART CODE	STOCK NO.	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P.W.B.O.A.R.D. ASSY	APSDS010AD												
1						RD25PJ473X		CARBON FILM R.	0.25W 47K OHM 5%	R8				1
2						RGHARJ181B		M-OXIDE FILM R.		R4				1
3						RG1ARJ181B		M-OXIDE FILM R.		R5				1
4						RPJNB22201		SEMI FIXED VR.		RV1	RV2			2
5						THG24B001W		HEATER TRANS.		T1				1
6						VS627RB001		SPONGE		22				1
7						ZL24FW17XA		F L INDICATOR		LT1				1
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														

EXPLODED ASSEMBLY	PART NAME		PART CODE	STOCK NO.	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P.W.B.O.A.R.D. ASSY	APSDS010AD												
1						BTPW3003BZ		BRAS. TAP SCREW	+ BIT, M3 X 8 S-ZNCR	B24-1	B24-2			2
2						CEVE101ALX		ELYT. CAPACITOR		C7				1
3						CEVE470ALX		ELYT. CAPACITOR		C6				1
4						CEVG010ALX		ELYT. CAPACITOR		C1	C2	C5		3
5						CEVG2R2ALX		ELYT. CAPACITOR		C8				1
6						CKFB473ZFT		CERAMIC CAP.	0.047MFD 50V -20, +80% F	C10	C9			2
7						CQMB682KTH		MYLAR CAPACITOR	6800PF 50V -10, +10%	C3	C4			2
8						ML7525X001		FL BRACKET		Z1				1
9						PSA2RC00CX		PRINTED W.B.O.A.R.D.						1
10						PSDS010C0X		PRINTED W.B.O.A.R.D.						1
11						QDSEM1ZX0		SILICON DIODE	EMIZ SANKEN	D3				1
12						QDSMA150KN		SILICON DIODE	MA150 VF 1.2V, VR 35V NO-RANK 24MIN	D1	D2	D5	D6	4
13						QDZ180EB3A		ZENER DIODE	RD18EB3 VZ 17.42-18.33V	D4				1
14						QQM07318AT		I.C.	TA7318P-2	U1				1
15						QQM12010AB		IC	HA12010	U2	U3			2
16						QTC1685XDN		TRANSISTOR	ZSC1685 R, S-RANK	Q2				1
17						QTC1826XBD		TRANSISTOR	ZSC1826 D, Y-RANK NO ACCESSORIES	Q1				1
18						RD25PJ104X		CARBON FILM R.	0.25W 100K OHM 5%	R1	R2	R3		3
19						RD25PJ152X		CARBON FILM R.	0.25W 1.5K OHM 5%	R6				1
20						RD25PJ220X		CARBON FILM R.	0.25W 22 OHM 5%	R7				1
21						RD25PJ472X		CARBON FILM R.	0.25W 4.7K OHM 5%	R9				1

EXPLODED ASSEMBLY	PART NAME		PART CODE	STOCK NO.	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P.W.B.O.A.R.D. ASSY	APSMA035CD												
1						BTPW3008AZ		BRAS. TAP SCREW	+ BIT, M3 X 8 S-ZNCR	B1-1	B1-2	B1-3	B2-1	5
2										B2-2				
3						CCDB181K0M		CERAMIC CAP.	180PF 50V -10, +10% SL	C70				1
4						CCF3331K0T		CERAMIC CAP.	330PF 50V -10, +10% SL	C11	C12	C3	C4	4
5						CCGB020C0T		CERAMIC CAP.	SL 2PF 50V -0.25, +0.25PF	C63	C64			2
6						CCGB030C0T		CERAMIC CAP.	SL 3PF 50V -0.25, +0.25PF	C7	C8			2
7						CCGB101K0T		CERAMIC CAP.	100PF 50V -10, +10% SL	C13	C14	C15	C16	4
8						CCGB220K0T		CERAMIC CAP.	22PF 50V -10, +10% SL	C10	C9			2
9						CEAD101ALX		ELYT. CAPACITOR	100MFD 16V	C54				1
10						CEAD102ALX		ELYT. CAPACITOR	1000MFD 16V	C52				1
11						CEAE101ALX		ELYT. CAPACITOR	100MFD 25V	C49	C50			2
12						CEAE221ALX		ELYT. CAPACITOR	220MFD 25V	C47	C48	C55		3
13						CEAE470ALX		ELYT. CAPACITOR	47MFD 25V	C19	C20	C59		3
14						CEAF220ALX		ELYT. CAPACITOR	22MFD 35V	C33				1
15						CEQ1E68202		ELYT. CAPACITOR		C51				1
16						CEQ1G82202		ELYT. CAPACITOR		C43	C44			2
17						CEVC101ALX		ELYT. CAPACITOR		C31	C32			2
18						CEVC470ALX		ELYT. CAPACITOR		C5	C6			2
19						CEVD220ALX		ELYT. CAPACITOR		C66				1
20						CEVE2R2ALX		ELYT. CAPACITOR		C34				1
21						CEVE4R7ALX		ELYT. CAPACITOR		C21	C22	C23	C24	4



EXPLODED ASSEMBLY		PART NAME		PART CODE						
P.W. BOARD ASSY		AP5MA035CD								
1	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		CEVGG10ALX		ELYT. CAPACITOR		C1	C17	C18	C2	4
2		CEVGI00ALX		ELYT. CAPACITOR		C57	C58			2
3		CKDE103PEM		CERAMIC CAP.	0.01MFD 500V -0, +100% E	C35	C36	C37	C38	11
4						C39	C40	C41	C42	
5						C60	C61	C62		
6		CKFB223ZFT		CERAMIC CAP.	0.022MFD 50V -20, +80% F	C25	C26	C27	C28	4
7		CKFB473ZFT		CERAMIC CAP.	0.047MFD 50V -20, +80% F	C56	C65			2
8		CKG3551KBT		CERAMIC CAP.	560PF 50V -10, +10% B	C45	C46	C53		3
9		CQMC563KEH		MYLAR CAPACITOR		C29	C30			2
10		LA3LE1024A		CHOKE COIL		L1	L2			2
11		MU232AD002		HEAT SINK		HS1	HS2			2
12		MU622AD002		HEAT SINK		HS3				1
13		MU622AD003		HEAT SINK		HS4				1
14		MW201BS001		TERMINAL						39
15		MW401CX002		SHORT JUMPER						1
16		MW401CX006		SHOT JUMPER	10MM					30
17		PSMA035C0X		PRINTED W. BOARD						1
18		QDSGP25GAG		SILICON DIODE	GP25GA 400V A-RANK	D19	D20	D21	D22	4
19		QDSN4448XZ		SILICON DIODE	1N4448 VRM 100V NO-RANK	D10	D11	D12	D13	11
20						D14	D15	D16	D18	
21						D7	D8	D9		

EXPLODED ASSEMBLY		PART NAME		PART CODE						
		P.W. BOARD ASSY		AP5MA035C0						
1	REMARKS	PART CODE	PART, STOCK NUMBER	CYBERNET PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		RD25PJ154X		CARBON FILM R.	0.25W 150K OHM 5%	R1	R2			2
2		RD25PJ182X		CARBON FILM R.	0.25W 1.8K OHM 5%	R11	R12	R7	R8	4
3		RD25PJ223X		CARBON FILM R.	0.25W 22K OHM 5%	R10	R43	R44	R69	5
4						R9				
5		RD25PJ224X		CARBON FILM R.	0.25W 220K OHM 5%	R68				1
6		RD25PJ332X		CARBON FILM R.	0.25W 3.3K OHM 5%	R37	R38	R45	R46	4
7		RD25PJ333X		CARBON FILM R.	0.25W 33K OHM 5%	R21	R22	R40		3
8		RD25PJ394X		CARBON FILM R.	0.25W 390K OHM 5%	R47				1
9		RD25PJ471X		CARBON FILM R.	0.25W 470 OHM 5%	R61	R62			2
10		RD25PJ472X		CARBON FILM R.	0.25W 4.7K OHM 5%	R67				1
11		RD25PJ560X		CARBON FILM R.	0.25W 56 OHM 5%	R55	R56			2
12		RD25PJ682X		CARBON FILM R.	0.25W 6.8K OHM 5%	R54				1
13		RD25PJ683X		CARBON FILM R.	0.25W 68K OHM 5%	R3	R4	R53		3
14		RD25TJ301X		CARBON FILM R.	0.25W 300 OHM 5%	R33	R34			2
15		RD25TJ331X		CARBON FILM R.	0.25W 330 OHM 5%	R31	R32			2
16		RD25TJ5R6X		CARBON FILM R.	0.25W 5.6 OHM 5%	R15	R16			2
17		RF02QKR47B		WIRE WOUND R.		R27	R28	R29	R30	4
18		RGHANJ101B		M-OXIDE FILM R.	1/2W 100 OHM 5%	R52				1
19		RGHANJ222B		M-OXIDE FILM R.	1/2W 2.2K OHM 5%	R17	R18			2
20		RGHANJ272B		M-OXIDE FILM R.	1/2W 2.7K OHM 5%	R50				1
21		RGHANJ472B		M-OXIDE FILM R.	1/2W 4.7K OHM 5%	R19	R20			2

EXPLODED ASSEMBLY		PART NAME	PART CODE											
		P.W. BOARD ASSY	AP5MA035CD											
1	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS				SYMBOLIC OR EXPLODED VIEW NO.				QTY USED	
1		QDSRA12XXD		SILICON DIODE	RA1Z	NO-RANK				D17	D25	D26	D27	10
2									D28	D3	D30	D4		
3									D5	D6				
4		QDZRD22ECA		ZENER DIODE	RD22EC	VZ 22-24.5 C-RANK				D23	D24	D31	3	
5		QDZ150EB1A		ZENER DIODE	RD15EB1	VZ 13.44-14.13V				D29			1	
6		QDZ5R6EB3A		ZENER DIODE	RD5R6EB3	VZ 5.61-5.91V				D32			1	
7		QTA0720XBH		TRANSISTOR	Z5A720	Q,R-RANK				Q11	Q12		2	
8		QTA0733XDA		TRANSISTOR	Z5A733	P,Q-RANK				Q13	Q16		2	
9		QTA0758XBD		TRANSISTOR	Z5A768	Q,Y-RANK				Q19			1	
10		QTA0794XAN		TRANSISTOR	Z5A794	Q,R-RANK				Q7	Q8		2	
11		QTA0798XEE		TRANSISTOR	Z5A798	F,G-RANK BREAK VOLTAGE 70V				Q1	Q2		2	
12		QTC0945AEA		TRANSISTOR	Z5C945A	P,Q-RANK				Q14	Q15	Q20	3	
13		QTC1319XDN		TRANSISTOR	Z5C1318	Q,R-RANK				Q10	Q22	Q9	3	
14		QTC1567XAN		TRANSISTOR	Z5C1567	Q,R-RANK				Q5	Q6		2	
15		QTC1685XAN		TRANSISTOR	Z5C1685	Q,R-RANK				Q23			1	
16		QTC1826XBD		TRANSISTOR	Z5C1826	Q, Y-RANK NO ACCESSORIES				Q17	Q18	Q21	3	
17		QTC1885XAN		TRANSISTOR	Z5C1885	R,S-RANK				Q3	Q4		2	
18		RD25PJ101X		CARBON FILM R.	0.25W	100 OHM	5%		R35	R36	R66		3	
19		RD25PJ102X		CARBON FILM R.	0.25W	1K OHM	5%		R5	R6			2	
20		RD25PJ104X		CARBON FILM R.	0.25W	100K OHM	5%		R49				1	
21		RD25PJ124X		CARBON FILM R.	0.25W	120K OHM	5%		R48					

EXPLODED ASSEMBLY		PART NAME		PART CODE						
P.W. BOARD ASSY		AP5MA035CD								
1	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		RGHARJ151B		M-OXIDE FILM R.		R23	R24	R25	R26	4
2		RGHARJ152B		M-OXIDE FILM R.		R59	R60			2
3		RGHARJ182B		M-OXIDE FILM R.		R39				1
4		RGHARJ221B		M-OXIDE FILM R.		R65				1
5		RGHARJ330B		M-OXIDE FILM R.		R13	R14			2
6		RGIARJ391B		M-OXIDE FILM R.		R51				1
7		RGIARJ820B		M-OXIDE FILM R.		R68				1
8		RPJNB33102		SEMI-FIXED VR.		RV1	RV2			2
9		RXHARJ100B		M-OXIDE FILM R.		R57	R58			2
10		RXHARJ5K6B		M-OXIDE FILM R.		R64				1
11		RX1ARJ5R6B		M-OXIDE FILM R.		R41	R42			2
12		WTH007EEXX		SOLID WIRE		N01				1
13		YHF0P0001Z		FUSE HOLDER		FH1	FH2	FH3	FH4	6
14						FH5	FH6			
15		ZFBQ20203A		FUSE		F3				1
16		ZFBQ40203A		FUSE		F1	F2			2
17		ZRA244102Z		RELAY		K2				1
18		ZRA438105U		RELLEY		K1				1
19										
20										
21										

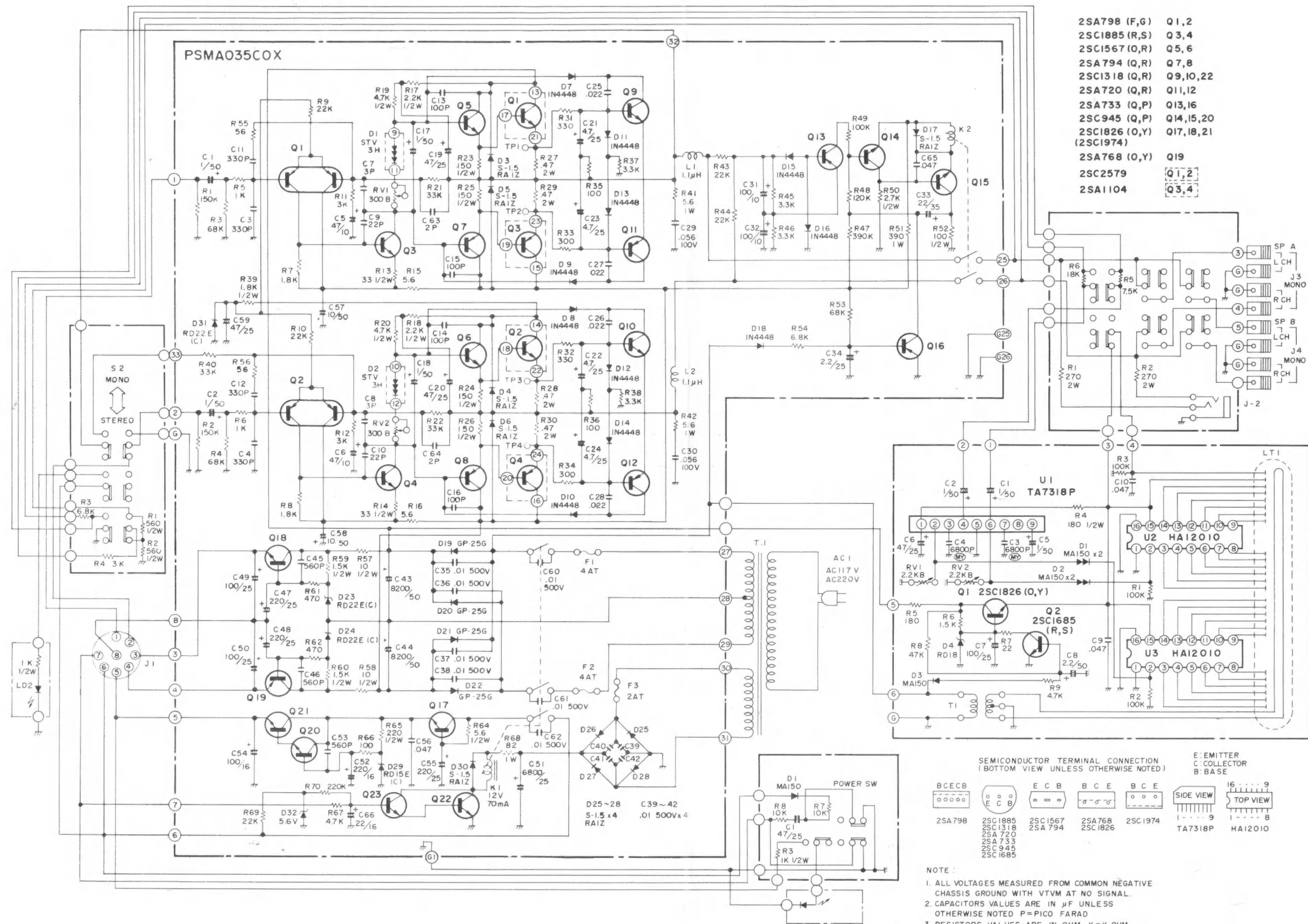
EXPLODED ASSEMBLY		PART NAME		PART CODE					
		P.W.BOARD ASSY		APSSW201AD					
1	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.			QTY USED
1		CEVE470ALX		ELYT. CAPACITOR		C1			1
2		PSSW201COX		PRINTED W.BOARD					1
3		QDSMA150XN		SILICON DIODE	MA150 VF 1.2V,VR 35V NO-RANK 24MIN	D1			1
4		RD25PJ103X		CARBON FILM R.	0.25W 10K OHM 5%	R7	R8		2
5		RD25PJ183X		CARBON FILM R.	0.25W 18K OHM 5%	R6			1
6		RD25PJ752X		CARBON FILM R.	0.25W 7.5K OHM 5%	R5			1
7		RGHARJ102B		M-OXIDE FILM R.		R3			1
8		RG2ARJ271B		M-OXIDE FILM R.		R1	R2		2
9		SP01AAX50A		PUSH SWITCH		S2			1
10		SP03CAX08A		PUSH SWITCH		S1			1
11		YJS03S024Z		PHONE JACK		J1			1
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									

EXPLODED ASSEMBLY		PART NAME		PART CODE					
		P.W.BOARD ASSY		APSZZ031AA					
1	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.			QTY USED
1		PSZZ031COX		PRINTED.W.BOARD					1
2		YZA2000004		3P U TERMINAL					1
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
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18									
19									
20									
21									

EXPLODED ASSEMBLY		PART NAME		PART CODE					
		P.W.BOARD ASSY		APSSW202AA					
1	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.			QTY USED
1		PSLD121COX		PRINTED W.BOARD					1
2		PSLD122COX		PRINTED W.BOARD					1
3		PSSW202COX		PRINTED W.BOARD					1
4		QLBLN317GN		L.E.D.	LN317GP GREEN	LED2			1
5		RD25PJ302X		CARBON FILM R.	0.25W 3K OHM 5%	R4			1
6		RD25PJ682X		CARBON FILM R.	0.25W 6.8K OHM 5%	R3			1
7		RGHARJ102B		M-OXIDE FILM R.		R5			1
8		RGHARJ561B		M-OXIDE FILM R.		R1	R2		2
9		SS0602032A		SLIDE SWITCH		S1			1
10		WTHC57ELXX		SOLID WIRE		N046			1
11		WTH021ELXX		SOLID WIRE		N050			1
12		WTH132ELXX		SOLID WIRE		N044			1
13		WTH144ELXX		SOLID WIRE		N028			1
14		WTH232ELXX		SOLID WIRE		N045			1
15		WTH446ELXX		SOLID WIRE		N031			1
16		WTH520ELXX		SOLID WIRE		N047			1
17		WTH617ELXX		SOLID WIRE		N048			1
18		WTH817ELXX		SOLID WIRE		N049			1
19		WUGP65EEXX		HI-WRAP WIRE		N060			1
20		WUG039EKXX		HI-WRAP WIRE		N061			1
21									

EXPLODED ASSEMBLY		PART NAME		PART CODE					
		P.W.BOARD ASSY		APSZZ031BA					
1	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.			QTY USED
1		PSZZ031COX		PRINTED.W.BOARD					1
2		YZA3500003		5P U TERMINAL					1
3									
4									
5									
6									
7									
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Schematic Diagram





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